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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,650	07/30/2003	Tsutomu Kadotani	Q76784	6845
23373	7590	06/12/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			CHOWDHURY, TARIFUR RASHID	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1, 5, 10 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujioka et al., (Fujioka), USPAT 6,124,917.**

3. Fujioka discloses and shows in Fig. 27, a LCD device comprising:

- a first substrate (401) on which pixels are arranged;
- a second substrate (402) coupled to the first substrate with a sealing member (403) in such a way as to form a gap between the first and second substrates;
- a liquid crystal layer (410) formed in the gap, the liquid crystal layer being confined by the sealing member; and
- spacers (416) arranged in the liquid crystal layer;

wherein the first substrate has a display region for displaying images, the display region being defined to include the pixels;

wherein the first substrate has a non-display region formed outside the display region, the non-display region being located between the display region and the sealing member;

wherein the spacers are located in a first part of the liquid crystal layer

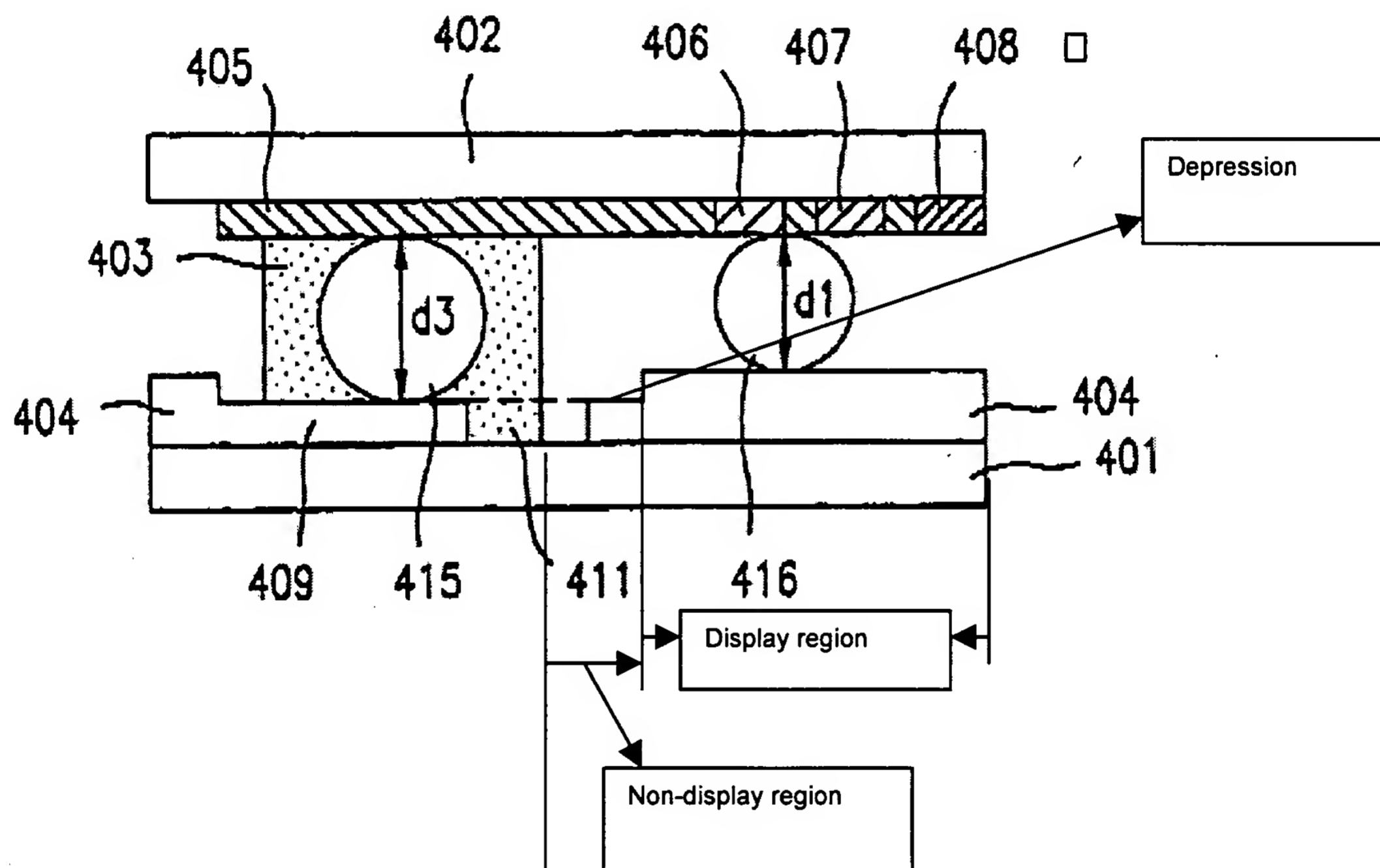
corresponding to the display region while none of the spacers are located in a second part of the liquid crystal layer corresponding to the non-display region; and

further comprising a depression formed on an inner surface of the first substrate;

wherein the depression is located in the second part of the liquid crystal layer,

and the depression constitutes a buffer space for receiving extra liquid crystal (410).

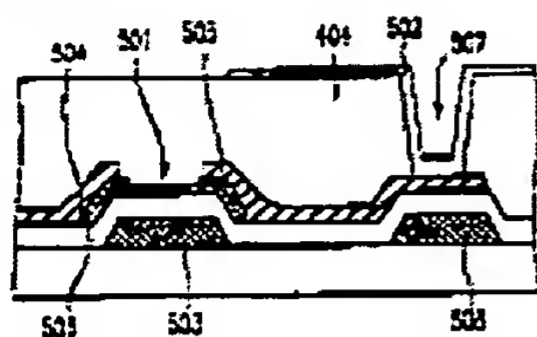
**FIG. 27**



Accordingly, claims 1 and 22 are anticipated.

As to claim 5, it is clear from Fig. 22 of Fujioka that TFTs are arranged on the first substrate in such a way as to be electrically connected to the respective pixels, and a

FIG. 22



dielectric layer (404) is formed on the first substrate to cover the TFTs and the pixels and wherein the depression is formed in the dielectric layer (Fig. 27).

As to claim 10, it is clear from Fig. 27 of Fujioka that the depression forms a step between the display region and the non-display region.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka in view of Miyazaki et al., (Miyazaki), USPAT 5,978,061.**

6. As to claim 6, Fujioka discloses the LCD device as recited above, however, fails to specifically disclose a dielectric layer having a depression formed on the second substrate.

Miyazaki discloses an LCD device having a dielectric layer (Fig. 1, ref. 35) having a depression formed on the second substrate.

It would have been obvious to one of ordinary skill in the art at the time of the

invention was made to have a dielectric layer having a depression formed on the second substrate since one would be motivated to improve alignment and orientation, and ultimately to reduce display defect attributed in cell gap (col. 3, lines 15-19).

As to claim 7, Fujioka discloses the LCD device as recited above, however fails to specifically disclose one of the first or second substrate having a transparent plate having a depressed part on its inner surface.

Miyazaki discloses an LCD device where the second substrate has a transparent plate (Fig. 1, ref. 34) having a depression part on its inner surface.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have one of the first and second substrates having a transparent plate with a depressed part on its inner surface since one would be motivated to provide electrode function as well as to reduce display defect attributed to deterioration in cell gap, increase yield, and provide optimum display performance (col. 3, lines 15-19).

As to claim 9, Fujioka discloses the LCD device as recited above, however, fails to specifically disclose spacers that are pole shaped formed on one of the first and second substrates.

Miyazaki discloses an LCD device having spacers that are pole-shaped (Fig. 1, ref. 33) formed on one of the first and second substrates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have spacers that are pole-shaped formed on one of the first and second substrates since one would be motivated to minimize rubbing cloth during the rubbing process so that an orientation defective area does not extend into the

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pixel area (abstract). Ultimately, this serves to reduce display defect attributed to deterioration in cell gap, increase yield, and provide optimum display performance (col. 3, lines 15-19).

**7. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka in view of Kijima et al., (Kijima), USPAT 6,259,500.**

8. Fujioka discloses the LCD device as recited above, however, fails to specifically disclose the satisfaction of the expression,  $H \geq (1/2) * (1000 + L) * [0.02d + [L * (0.02D/1000)]/L] (T_m)$ .

9. Kijima discloses an LCD device having spacers formed in the display region and none of the spacers being formed in the non-display region (Fig. 8b).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have satisfied the relationship  $H \geq (1/2) * (1000 + L) * [0.02d + [L * (0.02D/1000)]/L] (T_m)$  is satisfied (col. 16, lines 17-46), since one would be motivated to suppress the level of non-uniformity due to variation in cell thickness to an acceptable level so that a convex/concave profile can be provided (col. 16, lines 17-47). Ultimately this serves to help realize a uniform cell thickness across the entire panel and improve display quality (col. 5, lines 7-29).

**10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujioka in view of Kijima and further in view of Murade et al., (Murade), USPAT 6,433,841.**

11. Fujioka discloses an LCD device as recited above, however, fails to explicitly disclose a dielectric overcoat layer on at least a portion of the second substrate wherein

at least a portion of the layer is selectively etched to remove portions of the dielectric overcoat layer and formed the depression.

Kijima discloses an LCD device having a dielectric overcoat layer (Fig. 8b, ref. 33) on at least a portion of the second substrate (11). Murade discloses an LCD device where a step includes depositing a dielectric overcoat layer and forming a resist pattern to form the depressions by a predetermined and selective etching (col. 6, lines 44-54).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a dielectric overcoat layer (on at least a portion of the second substrate and selectively perform etching to remove portions of the dielectric overcoat layer and form the depression since one would be motivated not only by the photolithographic conventions of forming such a depression but to provide a more flattened area for alignment so that the aperture area and the non-aperture area are made flush with each other for the purpose of enhancing design matters and achieving a greater degree of fineness and the optimal field (col. 15, line 51 – col. 16, line 18). Ultimately, forming overcoat layer on the second substrate would prevent contamination and forming the depression in this way serves to a remarkably improved degree of freedom in design, making it simpler to conduct normally difficult manufacturing steps and reducing cost (col. 3, lines 31-67).

### ***Response to Arguments***

12. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

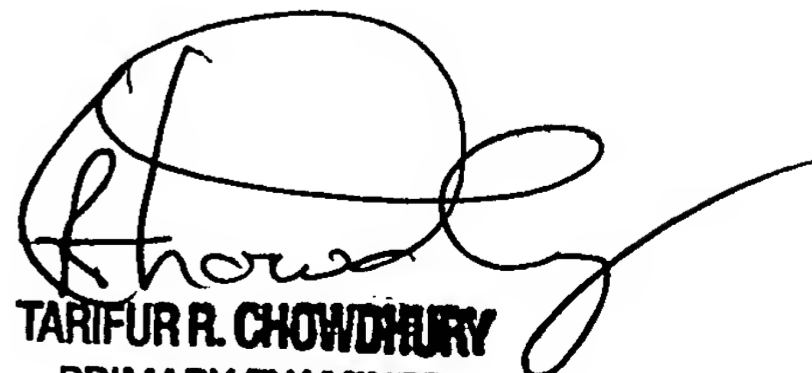
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R. Chowdhury whose telephone number is (571) 272-2287. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nelms C. David can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TRC  
June 07, 2006

  
TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER